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# TORREYA

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## LOCAL FLORA NOTES—STATEN ISLAND\*

BY ARTHUR HOLLICK

Staten Island, or the Borough of Richmond of Greater New York, has been so thoroughly explored that recorded additions to its flora in recent years have been very few; and the growth of the community during the same time has probably resulted in the total or partial extinction of as many native species as have been added. On the other hand the advance of civilization has brought with it a number of alien species, some of which have become permanent elements in the local flora. In this connection two restricted areas have enlisted my interest and attracted my special attention during a little longer than the past decade. One of these, on and in the vicinity of Todt Hill, is an area that has undergone relatively little change in its natural environment for several generations other than its modifications due to the development of the golf links of the Richmond County Country Club. The other, in the vicinity of Arlington station on the North Shore branch of the Rapid Transit Railroad, has been completely changed from its natural conditions by commercial developments.

The Todt Hill area possesses geological as well as botanical features of interest, and the two are closely interrelated. When the continental glacier of the ice age reached Staten Island in its advance from the northwest it was unable to surmount the highest point immediately north of Todt Hill, and flowed around its flanks to the east and west, leaving unglaciated a small portion of the ridge of serpentinite rock in the form of a conspicuous morainal embayment or sinus. This is the Todt Hill area, and is the only area on the serpentinite ridge in which the sub-surface and most of the surface soil is composed of the disintegrated underlying rock. It is largely an undisturbed mag-

\* Presented at the meeting of the Torrey Botanical Club, October 26, 1921.

nesia-iron soil, formed in place, and it supports a characteristic native flora which has been so frequently mentioned and discussed that only incidental reference to it here is necessary. Among its most conspicuous elements are *Cerastium velutinum* Raf., *Silene Caroliniana* Walt., *Viorna ochroleuca* (Ait.) Small, *Arabis lyrata* L., *Prunus Americana* Marsh., *Viola pedata* L., *Asclepias verticillata* L., *Acerates viridiflora* (Raf.) Eaton, *Houstonia coerulea* L., and *Ionactis linariifolius* (L.) Greene.

Among the introduced trees and shrubs that have become permanently established in the area, but which are rare or wanting elsewhere on Staten Island, may be mentioned *Salix fragilis latifolia* Anders., *Alnus Alnus* (L.) Britton, *Philadelphus coronarius* L., *Opulaster opulifolius* (L.) Kuntze, *Prunus Mahaleb* L., *Cytisus triflorus* L'Her., and *Ptelea trifoliata* L. These doubtless originated from garden waste, but the first two and the one last mentioned have spread quite extensively by seed. About five or six years ago *Hypochaeris radicata* L. first made its appearance on the golf links and since then has become a troublesome weed. *Solanum Carolinense* L. has also appeared recently, associated with the species last mentioned; but both species are rare elsewhere on the island. *Helianthus mollis* Lam., a species new to the Staten Island flora, was found for the first time this year, represented by a few thrifty specimens on Todt Hill. This is a species introduced from the West, previously recorded from four more or less widely scattered localities within the local flora range—at Tinicum, Delaware Co., Pa., Pestletown, N. J., and Garden City and Manhasset Neck, Long Island.

The area at Arlington covers about half a square mile of territory. Its foundation, at tide level, is natural salt meadow, on which has been built up a superstructure, to an average height of about fifteen feet, composed of waste material of all kinds, including garbage, street sweepings, ballast from vessels, mud and silt dredged from the adjacent water-ways, refuse from freight and cattle trains, etc., and a surface of ashes and cinders from the railroad and nearby factories.

My first visit to this area was made in 1908, when the following introduced species, new to the flora of Staten Island, were collected: *Holcus halepensis* L., *Capriola Dactylon* (L.) Kuntze, *Eragrostis major* Host., *Cyperus compressus* L., *Cyperus rotundus* L., *Chenopodium anthelminticum* L., *Salsola pestiger* A. Nelson,

*Amaranthus deflexus* L., *A. spinosus* L., *Lepidium medium* Greene, *Sinapis alba* L., *Cleome spinosa* L., *Pedicularia pentaphylla* (L.) Schrank, *Sesban macrocarpa* Muhl., *Chamaesyce hirta* (L.) Millsp., and *Sesamum Indicum* L.—elements in the vegetation of the Old World, Tropical America, and the southern and western United States, some of which might be expected to become permanent and, perhaps, undesirable residents.

From time to time the area was subsequently visited and carefully explored, in order to note which of the species had persisted, which had disappeared, and what others new to Staten Island might have been introduced. In 1910 only five of the species previously listed were found; but it is of interest to note that one of these was *Sesamum Indicum*, a native of Asia and Africa. In 1917 this species was still there, and *Melochia corchorifolia* L. and *Anoda triangularis* (Willd.) D.C. were added to the list. In 1918, I was able to find only four of all the species listed, viz. *Chenopodium anthelminticum*, *Amaranthus spinosus*, *Lepidium medium*, and *Sinapis alba*; but the following newcomers were noted: *Rumex Mexicanus* Meissn., *Chenopodium lanceolatum* Muhl., and *Helianthus petiolaris* Nutt. My last visit was made in September 1921. It was evident that the elimination of species unsuited to the environment was almost complete, and that a vegetation destined to become permanently established there, represented by a relatively few dominant elements, was now the salient feature of interest in the area. Thrifty young trees of *Populus candicans* Ait., *Populus deltoides* Marsh., *Salix alba* L., *Betula populifolia* Marsh., and *Ailanthus glandulosa* Desf. were growing there; but the most conspicuous feature was the dense stands of *Oenothera biennis* L. and *Helianthus annuus* L. One patch of the latter covered about a quarter of an acre, to the almost total exclusion of everything else—the growth was so close and dense. Elsewhere the mass of the vegetation was made up of our common waste land and garden weeds and coarse grasses. Incidentally the following introduced species new to the Staten Island flora were collected: *Persicaria persicarioides* (H.B.K.) Small, *Pleuropterus Zuccarini* Small, and *Helianthus hirsutus* Raf. The first one, so far as I am aware, has not heretofore been recorded growing in our local flora range, and the last one is recorded from the range only from Northampton and Monroe Counties, Pa.